REMARKS

Claims 1-17 are pending in the present application. No claim amendments have been made. Fig. 1 has been amended in response to the Drawing objection at page 2 of the office action. A separate proposed changes to the drawings is submitted herewith. Support for the drawing changes can be found in the specification at paragraphs 0039, 0045 and 0046. Accordingly, applicant respectfully submits that no new matter has been added.

Applicant respectfully requests reconsideration and withdrawal of the claim rejections for the reasons that follow.

Claim Rejections Under 35 U.S.C. § 103(a)

In the Office Action, claims 1, 3, and 6-9 were rejected under 35 U.S.C. §103 as being unpatentable over Lauinger et al. (USP 5,982,483) in view of Tomioka et al. (USP 5,088,816). Claim 2 was rejected under 35 U.S.C. §103(a) as being unpatentable over Lauinger et al. in view of Tomioka et al. as applied to claim 1, and further in view of Ostermeier (USP 4,634,248). Claims 4 and 5 were rejected under 35 U.S.C. §103(a) as being unpatentable over Lauinger et al. in view of Tomioka et al. as applied to claim 1, and further in view of Bawolek et al. (USP 5,914,749). Claims 10, 14, 15 and 17 are rejected under 35 U.S.C. §103(a) as being unpatentable over Lauinger et al. in view of Tomioka et al., and further in view of Sasaki (USP 4,965,663). Claims 11-13 and 16 were rejected under 35 U.S.C. §103(a) as being unpatentable over Lauinger et al. in view of Tomioka et al., and further in view of Sasaki as applied to claims 10 and 15, and further in view of Chamberlain et al. (USP 6,411,746). Applicant respectfully traverses these rejections for the following reasons.

With respect to claims 1, 3, and 6-9, a *prima facie* case of obviousness has not been established. In particular, the Lauinger/Tomioka combination does not teach or suggest the claimed structure of the grating optical sensor, namely the required "at least one light-diffusion plate arranged in either a pupillary plane of the lens or a pupillary plane conjugate to the lens or both." Applicant agrees with the patent office that Lauinger is silent with respect to this feature. Concerning Tomioka, this reference does not teach or suggest the claimed placement of a light diffusion plate "in either a pupillary plane of the lens or a pupillary plane conjugate to the lens or both."

The features of the claimed diffusion plate are explained in the specification, see e.g., paragraph 0023. The diffusion plate is arranged in either a pupillary plane of the lens imaging the object space or in a pupillary plane conjugate to the lens because this location in the optical system provides for color constancy performance of a grating optical sensor adaptable to variable illumination. See e.g., specification, para. 0022.

By way of background, it is known that "the image that will be formed in a photographic camera, i.e. the distribution of intensity on the sensitive layer, is present in an invisible, mysterious way in the aperture of the lens, where the intensity is equal at all points." (F. Zernike, Proc.Phys.Soc. London 61, (1948), p. 158).

By way of further background, the distribution of intensity in the image plane represents the local information about each point in the object space. The intensity within the aperture (the pupillary plane) represents the global information about the overall illumination of the object space. It is an object of the invention to create a sensor which is able to adapt to changes in the illumination of the object space for guarantying an approximate color constancy corresponding to human vision. See specification, para. 0004. As claimed, the placement of a light diffusion plate in the pupillary plane (and/or a pupillary plane conjugate) scatters uniformly the global information into the image plane. This claimed structure results in an intensity of local images which automatically form the ratio of local to global intensity in the object space.

In contrast, Tomioka is silent with respect to this claimed feature. Tomioka is directed to a cell analysing flow system. The flow cell is illuminated by a strobe 10. Imaging of particles passing the flow cell is performed by an objective lens 90 using different magnifications and different thickness of the liquid flow. A diffusing plate 14 is disposed between a collecting lens 12 and a mirror 26 in the illumination beam path. See e.g., Tomioka, Fig. 1. The function of the diffusing plate 14 is described at col. 4, lines 29 to 46. The diffusing plate is inserted into the convergent or the parallel illumination beam path, not the pupillary plane or the pupillary plane conjugate or both. Tomioka's diffusing plate is also inserted in an alternating manner, whereby the plate 14 is in the beam path only some times or not at all, as conditions may arise. See Tomioka, col. 4, lines 40 to 42. By way of the diffusing plate, nonuniformity of

luminous intensity across the cross section of the light beam is substantially eliminated and uniform light is formed.

As Tomioka does not teach or suggest the above-mentioned claimed structural feature (i.e., the claimed location of the diffusion plate), applicant respectfully submits that claims 1, 3, and 6-9 are patentable over the Lauinger/Tomioka combination.

In addition, there is no suggestion in the prior art to modify Lauinger in the manner alleged, because even if one of ordinary skill in the art were to look to Tomioka, that reference would suggest a different location in which to place the diffusion plate. As mentioned above, Tomioka suggests placement of the diffusion plate in the convergent or the parallel illumination beam path, not the pupillary plane or the pupillary plane conjugate or both.

Moreover, if the diffusing plate 14 of Tomioka were used as required in the present application, it must be located in a light direction behind the flow cell 44 in the pupillary plane of objective lens 90. In this place, the diffusing plate will not function as required by Tomioka, in that it cannot serve to achieve uniform illumination of the flow cell. As such, Tomioka would not and does not suggest the placement of a diffusion plate at the pupillary plane (and/or pupillary plane conjugate) as claimed. Accordingly, a person of ordinary skill in the art would not be motivated to modify Lauinger in the manner alleged by looking to Tomioka because Tomioka does not even hint at placing a diffusing plate in the pupillary plane (or conjugate) of the imaging lens.

Thus, for at least these additional reasons, claims 1, 3, and 6-9 are patentable over the cited art. In addition, as the rejections of each of the device claims 1-14 are based, at least in part, on the Lauinger/Tomioka combination's alleged teaching of the diffusion plate feature, these claims are also patentable for the reasons stated above. Moreover, Ostermeier (which teaches diffusing the flashbulb of a camera), Bawolek (which teaches a MWY color system, but does not teach the use of a diffusion plate), Sasaki (which teaches a measurement of chromatic optical densisty), and Chamberlain (which teaches a tunable optical device with a heater) do not teach or suggest the claimed diffusing plate in the pupillary plane (or conjugate) of the imaging lens. Thus applicant respectfully submits that claims 1-14 are patentable over the cited art.

With respect to method claims 15-17, which were rejected based, at least in part, on the Lauinger/Tomioka/Sasaki combination, these claims are patentable over the cited art because Sasaki does not overcome the deficiencies of Lauinger/Tomioka.

First, the cited combination does not teach or suggest "superimposing into the image plane an incoherent background radiation assigned to the object space by diffuse scattering in either a pupil of the imaging lens or a plane conjugate to the lens or both" for at least the reasons stated above.

Moreover, the cited combination does not teach or suggest "forming a white standard signal from the diffraction pattern, assigned to a colorless part of the object space, with identical chromatically additive brightness values and a maximum trichromatically additive brightness value." In contrast, the method disclose by Sasaki is based on the densitometric measurement of three stimulus values R, G, B from the light reflected from the sample. In addition, three stimulus values Ro, Go, Bo are determined from a standard color, such as white. The standard values and the individual values are combined according to a mathematical algorithm.

The method in the present application does not claim use of a white standard as such but a special method for "forming" such a white standard signal, where the white standard signal is directly formed from chromatically additive brightness values and a maximum trichromatically additive brightness value assigned to a selected RGB diffraction pattern in the image plane.

Accordingly, applicant respectfully submits that claims 15-17 are patentable over the cited combination.

For at least the reasons stated above, applicant respectfully submits that the pending claims are allowable.

Conclusion

If applicant has not accounted for any fees required by this Amendment, the Commissioner is hereby authorized to charge to our Deposit Account No. 19-0741. If applicant has not accounted for a required extension of time under 37 C.F.R. § 1.136, that extension is requested and the corresponding fee should be charged to our Deposit Account.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

Respectfully submitted,

Date March 20, 2003

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